

3.8 HYDROLOGY AND WATER QUALITY

This EIR section analyzes the potential for adverse impacts on hydrology or water quality resulting from implementation of the proposed project. The Initial Study (Appendix A) identified the potential for impacts associated with violation of water quality standards or waste discharge requirements, degradation of water quality, inundation, and the alteration of existing drainage patterns in a manner which would cause substantial erosion, siltation, or runoff that would lead to flooding, exceeding capacity of stormwater drainage systems, or additional sources of polluted runoff. Issues scoped out from detailed analysis in the EIR include depletion of groundwater supplies or interference with groundwater recharge, as the City's groundwater wells are located a minimum of two miles inland from the project site and the City does not rely on groundwater that close to the ocean due to saltwater intrusion, and exposure of people or structures to a significant risk involving flooding because the construction of levees along the Santa Ana River to reduce anticipated flood levels by 6.5 feet prompted FEMA to revise flood maps to demonstrate the estimated flood level to be below the elevation of the project site. In addition, the proposed project would not place housing or structures within a 100-year flood hazard area. Data used to prepare this section were taken from the City's General Plan and the Drainage Study Including Preliminary Hydrology Analysis and Water Quality Analysis, prepared by Hunsaker & Associates dated April 14, 2003, portions of which are included as Appendix G. Full bibliographic entries for all reference materials are provided in Chapter 7 (References) of this document.

Comment letters on the IS/NOP pertaining to hydrology and water quality were received from the California Regional Water Quality Control Board, the County of Orange Planning & Development Services Department, Orange County Coastkeeper, the California Coastal Commission, and individuals.

3.8.1 Existing Conditions

Regional Hydrology

The City of Huntington Beach is located within the Santa Ana River Basin (SARB), a 2,800-square-mile area located roughly between Los Angeles and San Diego. The SARB is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwestward to the Pacific Ocean. The SARB can be divided into an upper basin and a lower basin. Lower Basin drainage is dominated by the flood control dam at El Prado. The Santa Ana Canyon, which separates Chino Hills from the Santa Ana Mountains, is the major drainage of Orange County. The lower Santa Ana River has been channelized and modified so that in most years flows do not reach the Pacific Ocean but are used to recharge groundwater.

The City is located in the SARB and within the Talbert Watershed District, which includes multiple tributary areas that contribute urban runoff along existing drainage channels. The Talbert Watershed covers 21.4 square miles straddling the mouth of the Santa Ana River. It includes portions of the cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach, and Santa Ana. Two main tributaries drain this watershed: on the western side, the Talbert and Huntington Beach Channels drain through the Talbert Marsh before emptying into the Pacific Ocean. On the eastern side, the Greenville-Banning Channel empties into the Santa Ana River.

Areawide Drainage Facilities

The Orange County Flood Control District (OCFCD) is responsible for the design, construction, operation, and maintenance of regional flood control facilities. The County flood channels are maintained annually, and maintenance includes debris and vegetation removal. The existing storm drainage channels were originally designed to accommodate 25-year flood events or less, the standard at the time.⁶ However, when the channels were constructed, they were built to accommodate only 65 percent of the 25-year flood event. The channels were built with restrictive channel bottoms, which reduce the amount of water the channel could carry, but which slow the flow rate of runoff water while still enabling the system to remove runoff water. The County now uses 100-year flood event standards for new storm drain construction and drainage improvements, and portions of the channels have been improved to accommodate up to a 100-year storm event.

The City of Huntington Beach is responsible for its own subregional and local drainage facilities (refer to Figure 3.8-1). The City owns and operates 15 storm drainage channel pumping stations that pump the runoff water into the channels and to the ocean. The City's channels, originally designed to accommodate up to 25-year flood events, are constructed at ground level, or at grade. The at-grade channels exacerbate the flooding potential because the amount of water that may be pumped into an at-grade channel is less than a below-grade channel. As a result, those areas flooded in a storm are most likely flooded because the pump stations are unable to pump a sufficient amount of water into the channels. If additional water is pumped, the channels may overflow.

⁶ Probabilistic assessments are given to define 10-year, 25-year, and 100-year flood events. For a 25-year flood, for example, this means a given flood event has a one-in-twenty-five (4 percent) of occurrence in any given year, or a "return period" of once every 25 years. Such assessments are based upon statistical frequency of collected data. In hydrology, there are actually three types of comparative assessments: (1) rainfall within a given time interval; (2) peak stream flow; or (3) volume of flow caused by a single storm event or sequence. Each of these attributes can be measured and counted as discrete data points to provide statistical comparison or frequency analysis. As a consequence, a location could experience a 25-year storm, a 25-year peak flow event, or a 25-year flood, all of which may or may not be independent of one another.

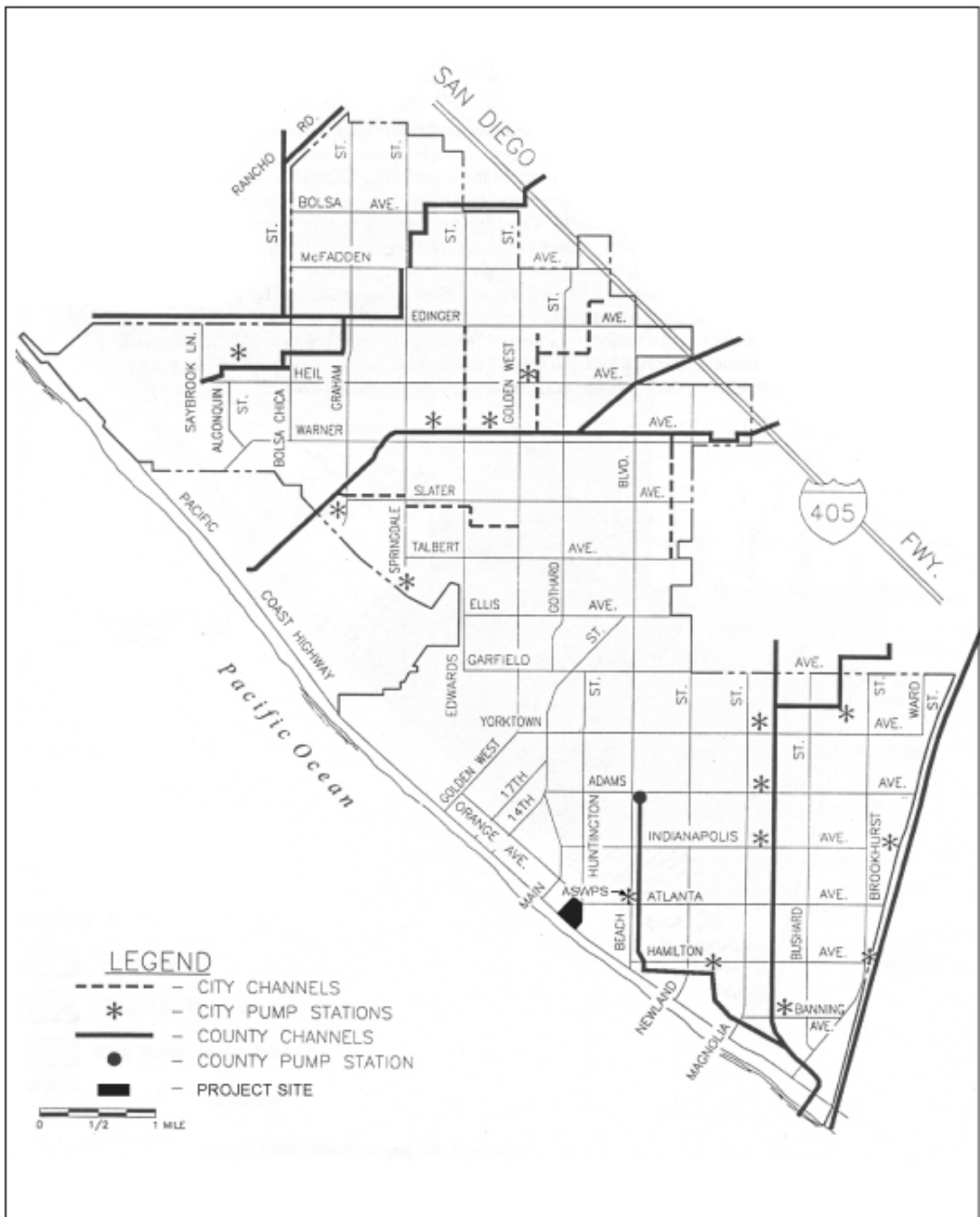


FIGURE 3.8-1
Drainage Channels and Pumping Stations

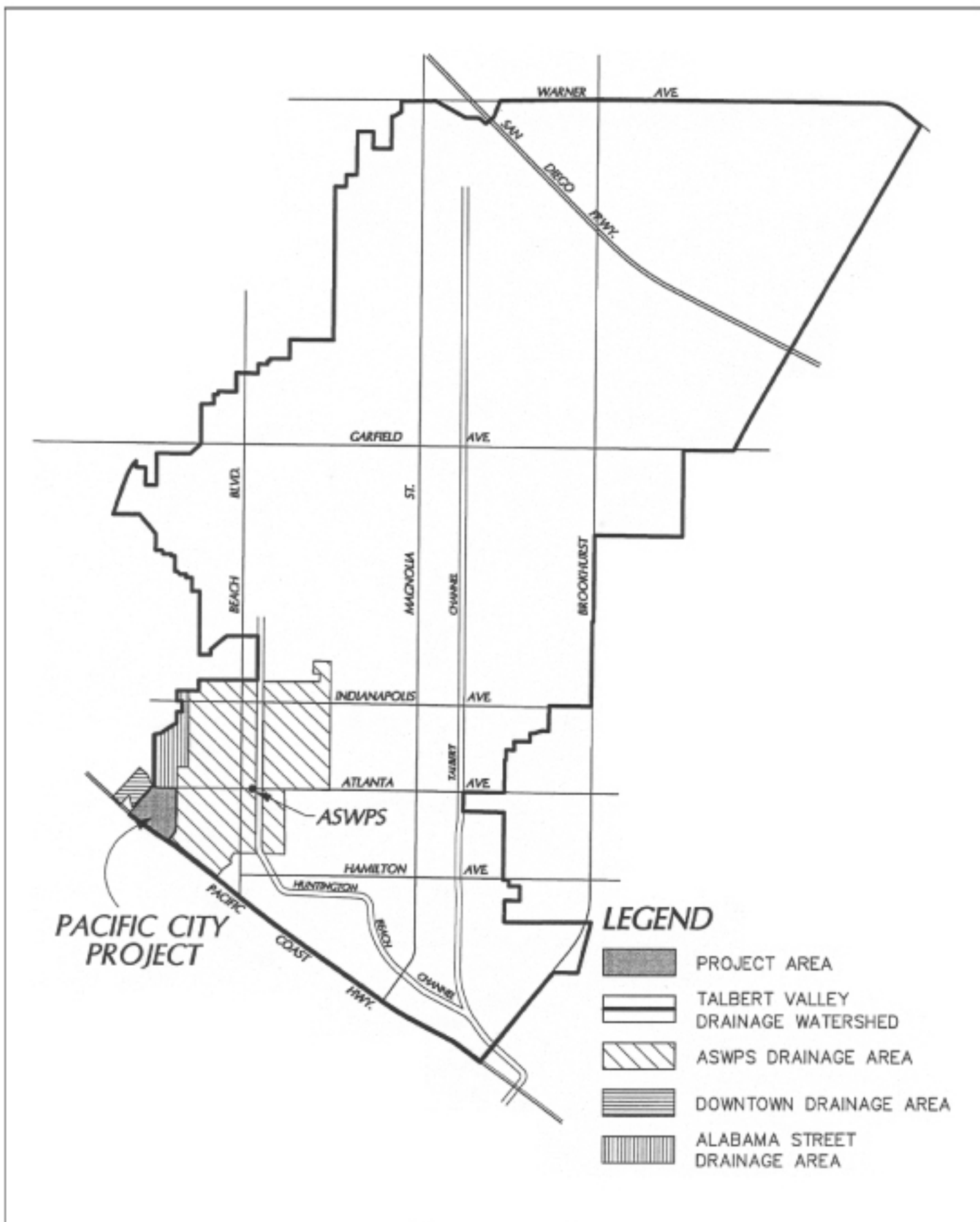


Drainage Facilities Affecting the Project Site

The project site has the potential to affect drainage facilities at the Atlanta Stormwater Pump Station (ASWPS) and the First Street Storm Drain System (FSSDS). Conditions at each of these facilities are discussed below.

The ASWPS is located at Atlanta Avenue, just east of Beach Boulevard, northeast of the project site, as indicated on Figure 3.8-2, and has an existing pumping capacity of 551 cubic feet per second (cfs). Stormwater entering the ASWPS is discharged into the Huntington Beach Channel (HB Channel D01). A large tributary area (618 acres, including the project site) flows into the ASWPS. Current surface runoff flows southerly towards Atlanta Avenue and east into the existing system at Atlanta Avenue and Delaware Street, through ASWPS, to the Huntington Beach Channel. A 100-year storm event yields approximately 1,125 cfs of runoff; consequently the ASWPS, by City estimates, requires a capacity of 1,125 cfs to provide protection for a 100-year storm event, and is therefore currently 574 cfs under capacity. The County of Orange is currently constructing improvements along the Huntington Beach Channel, with an expected completion in the summer of 2004. These improvements will increase the efficiency of the channel to a level capable of accommodating a 100-year storm event.

The FSSDS consists of an existing 36-inch pipe located in First Street, from the intersection of Olive Avenue. This existing drainage line serves the Downtown area and conveys runoff across PCH to the Pacific Ocean, where the runoff discharges at South Beach via an open ditch. The Downtown drainage area, consisting of 26.1 acres west of the project site, is approximately bounded by Orange Avenue/Atlanta Avenue to the north, First (Lake) Street to the east, PCH to the south, and Third Street to the west. The City of Huntington Beach is currently planning construction of a new (future Alabama Street storm drain “FASSD”) system in First Street to provide improved flood control protection. The new system will provide flood control protection to the Alabama Street drainage area, located north of the project. The FASSD is proposed to be constructed from Alabama Street to First Street, and connect to the existing FSSDS drainage line. The improvements to the First Street storm drain system are proposed and would occur independently of the proposed project.



Not to Scale

SOURCE: Hunsaker & Associates Irvine, Inc. 2003a



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FIGURE 3.8-2
Vicinity Map & Drainage Areas

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On-Site Drainage Patterns

The on-site drainage area boundary is approximately 34.6 acres and includes the project site as well as approximately 2.9 acres along Huntington Avenue and PCH. All on-site flows are currently directed via sheet flow and a graded ditch to an inlet located at the southeastern end of the site (refer to Figure 3.8-3). This discharge is conveyed to the existing 42-inch reinforced concrete pipe in Pacific View Avenue, through the ASWPS, and eventually to the Huntington Beach Channel. A summary of existing on-site discharges in 25- and 100-year flood events based on current rainfall data obtained from the 1986 Orange County Hydrology Manual is shown in Table 3.8-1 below.

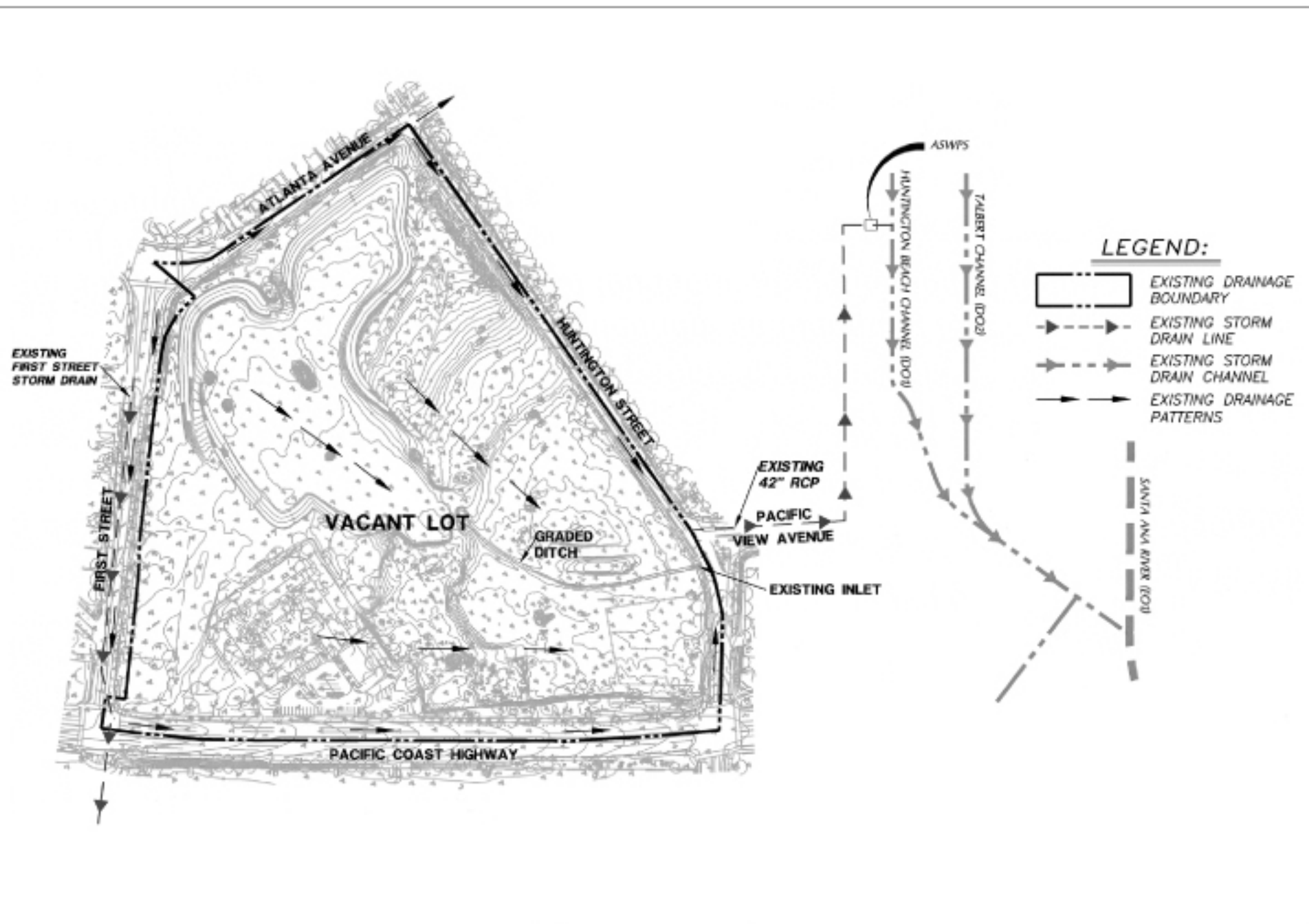
Table 3.8-1 Pre-Development Drainage Conditions (Post-1986 Values)	
Storm Event (Year)	On-Site Area (cfs)
25	48.6
100	67.0

SOURCE: *Drainage Study and Hydrology Analysis* by Hunsaker & Associates Irvine, Inc., dated April 14, 2003

Water Quality

Stormwater pollutants include a wide array of environmental, chemical, and biological compounds from both point and nonpoint sources. In the urban environment, stormwater characteristics depend on site conditions (e.g., land use, perviousness, pollution prevention), rain events (duration or intensity), soil type and particle size, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition. The EPA estimates that short-term runoff from construction sites, without adequate erosion and runoff control measures, can contribute more sediment to receiving waters than that deposited by natural processes over a period of several decades.

Stormwater quality in the City of Huntington Beach is typical of most urban areas in that it includes a variety of common contaminants. These pollutants consist primarily of suspended sediments, fertilizers and pesticides, animal waste, and contaminants that are commonly associated with automobiles (e.g., petroleum compounds such as oil, grease, and hydrocarbons). In addition, urban stormwater often contains high levels of soluble and particulate heavy metals generated from traffic, industrial facilities, and occasionally, residential sources. These metals are frequently found in concentrations that are harmful to aquatic life and other biota dependent on aquatic life as a food source. Two of the most common metals found in both the water column and sediments are zinc and copper. Zinc tends to exhibit toxicity effects in the fresh water environment; copper exhibits toxicity characteristics in the marine environment.



Not to Scale

SOURCE: Hunsaker & Associates Irvine, Inc. 2003a



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FIGURE 3.8-3
Existing Hydrology

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The ASWPS provides water quality protection for urban runoff. During dry weather and low-flow drainage events, the water from the ASWPS is discharged into the Orange County Sanitation District sewer lines. This allows for treatment of nuisance runoff.⁷ The majority of pollutants are transferred from impervious surfaces to receiving waters during nuisance flow conditions.

Tsunami

Tsunamis are seismically generated sea waves caused by sea-floor displacements (faulting or landslides), or similar large-scale, short-duration phenomena, such as volcanic eruptions. The tsunami warning system in the United States is a function of the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service. When a large earthquake occurs near the coast in the North Pacific, the regional warning system in Alaska, known as the Alaska Tsunami Warning Center (ATWC), determines the location (epicenter) and magnitude of the event. If an earthquake is considered to be great enough to generate a tsunami, the ATWC will issue an immediate "Tsunami Warning" for the area near the epicenter. This warning is issued through state emergency services offices, Coast Guard, military, FAA, National Weather Service, and other agencies.

The elevation of the tsunami run-up beyond the initial tidal elevation can be generally estimated from "maximum" past occurrence in California (estimated at 4 or 19 feet) from distant (South Pacific-South America-Alaska) or local (Santa Barbara Channel) earthquakes. The City of Huntington Beach Emergency Management Plan predicts the following wave heights, exclusive of tide and storm-generated wave heights, for a 100-year and 500-year tsunami occurrence:

<i>100-year Occurrence</i>	<i>500-year Occurrence</i>
4.0 feet minimum	6.8 feet minimum
6.6 feet average	11.4 feet average
9.2 feet maximum	16.0 feet maximum

No known tsunami has ever reached the Orange County coast, but in 1964, following the Alaska 8.2 earthquake, tidal surges of approximately four to five feet hit the Huntington Harbor area, causing moderate damage.

The tsunami threat to the City of Huntington Beach is considered low to moderate. Because tsunamis result from large offshore earthquakes and ocean landslides, local earthquakes would not generate a tsunami in the City. Because the City of Huntington Beach has southwestern-facing beaches, the City is vulnerable to tsunamis or tidal surges from the south and from the west. According to the City of Huntington Beach

⁷ Nuisance flows are those flows occurring primarily during dry weather (non storm drainage) that discharge into the storm drain system, and include runoff from irrigation of landscape, washing of cars, driveways, and sidewalks, etc.

General Plan, the eastern portion of the project site is located in a moderate tsunami run-up area (Figure 3.8-4). Of the six Huntington Beach Primary Danger Areas for tsunamis, which are listed in order of priority, the project site is located in “Primary Danger Area 4” under the City of Huntington Beach Emergency Management Plan. The suggested evacuation site for a tsunami incident in “Primary Danger Area 4” is Westminster High School, located at 14325 Golden West Street in Westminster.

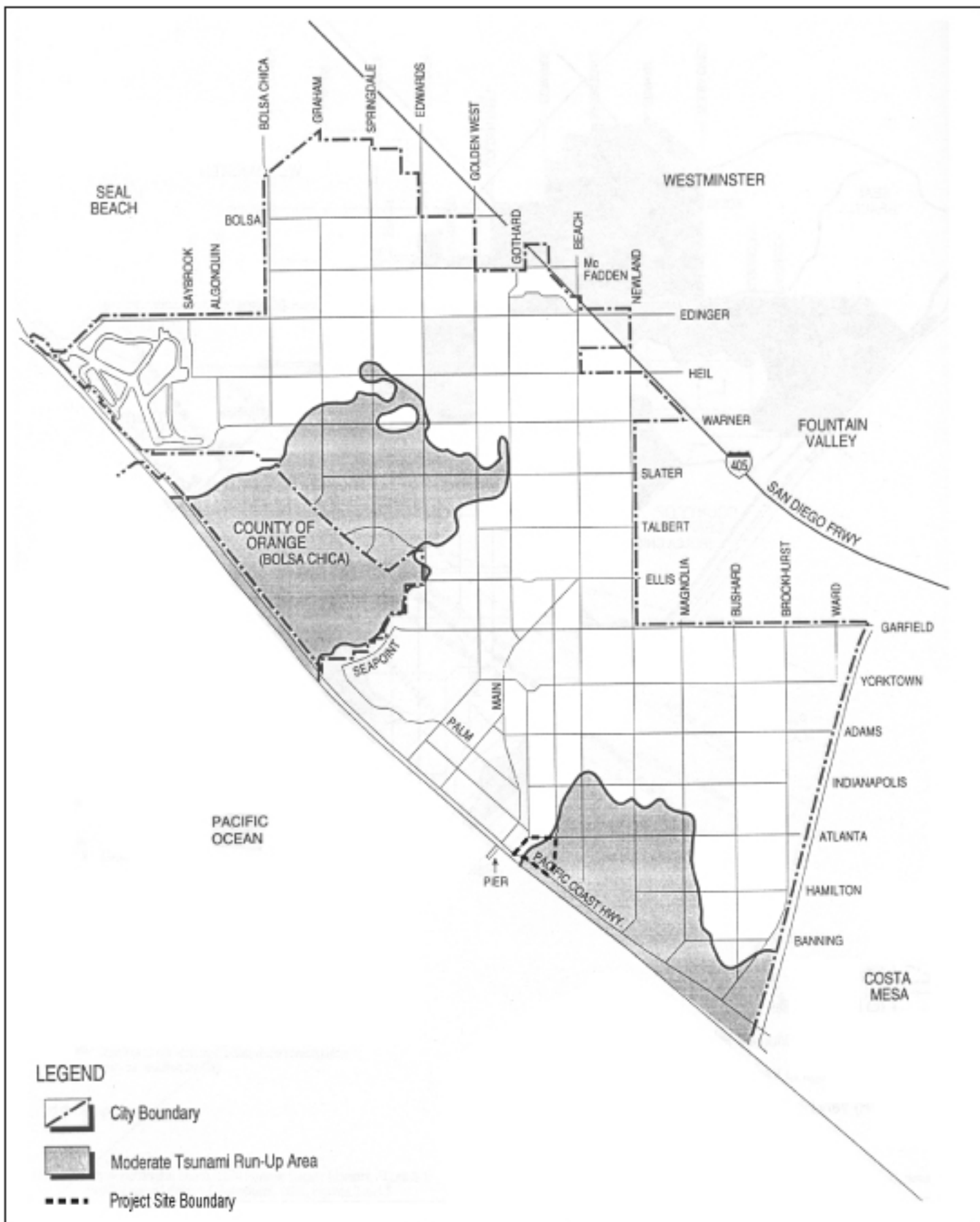
3.8.2 Regulatory Framework

The following subsection is brief summary of the regulatory context under which surface and groundwater resources are managed at the federal, State, and local level.

Clean Water Act

The 1972 amendments to the Clean Water Act (CWA) prohibit the discharge of pollutants to navigable waters from a point source (a discharge from a single conveyance such as a pipe) unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. In 1987, in recognition that diffuse, or nonpoint, sources were significantly impairing surface water quality, Congress amended the CWA to address nonpoint source stormwater runoff pollution in a phased program requiring NPDES permits for operators of municipal separate storm sewer systems (MS4s), construction projects, and industrial facilities. The purpose of the NPDES program is to establish a comprehensive stormwater quality program to manage urban stormwater and minimize pollution of the environment to the maximum extent practicable (MEP). The NPDES program consists of (1) characterizing receiving water quality, (2) identifying harmful constituents, (3) targeting potential sources of pollutants, and (4) implementing a Comprehensive Stormwater Management Program (CSWMP).

The State Water Resources Control Board (SWRCB) has adopted a statewide General Permit (WQ Order 99-08-DWQ) for stormwater discharges associated with construction activity. These regulations prohibit the discharge of stormwater from construction projects that include 5 acres or more of soil disturbance, unless the discharge is in compliance with the NPDES Phase 1 General Permit. Construction activities subject to this permit include clearing, grading, and other disturbance to the ground, such as stockpiling, or excavation that results in soil disturbance of at least 5 acres of total land area. In addition, as required by NPDES, because construction on the project site would occur over an area greater than 1 acre, the developer would be required to submit a Notice of Intent (NOI) to the SWRCB for coverage under the permit and would be required to comply with all its requirements.



Not to Scale

SOURCE: City of Huntington Beach 1996b



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FIGURE 3.8-4
Moderate Tsunami Run-Up Area

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The NPDES General Permit requires all dischargers to (1) develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs); (2) eliminate or reduce nonstormwater discharge to storm sewer systems; and (3) develop and implement a monitoring program of all BMPs specified. The two major objectives of the SWPPP are to (1) help identify the sources of sediment and other pollutants that affect the water quality of stormwater discharges and (2) to describe and insure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as nonstormwater discharges.

Basin Plan

Existing water quality issues have been identified in the watershed planning process and are incorporated in the Water Quality Control Plan (WCQP) for the Santa Ana River Basin (Basin Plan). The Basin Plan designates beneficial uses of the waters of the region and specifies water quality objectives intended to protect those uses. The Basin Plan also specifies an implementation plan describing actions that are necessary to achieve and maintain water quality standards, and regulates waste discharges to minimize and control their effects. Dischargers must comply with the water quality standards contained in the Basin Plan, and the proposed project would, therefore, be required to be consistent with this plan.

Orange County Drainage Area Management Plan

In order to ensure that construction sites implement the appropriate pollution control measures, the 2003 Orange County Drainage Area Management Plan (DAMP) details recommended BMPs to be applied to new development and significant redevelopment in Orange County. These regulatory requirements ensure that stormwater quality management is considered during a project's planning phase, implemented during construction, and maintained for the life of the project. Routine structural BMPs may function either to minimize the introduction of pollutants into the drainage system or to remove pollutants from the drainage system. Applicable structural and nonstructural BMPs implemented on the site for source control and pollution prevention to minimize the introduction of pollutants into the drainage system would depend on the ultimate configuration of the proposed land use.

Appropriate residential and retail/office center nonstructural BMPs listed in the DAMP that may be used on site to control typical runoff pollutants include homeowner/tenant education, activity restrictions, common area landscape management, BMP maintenance, common area litter and animal waste control, catch basin inspection, employee training, and private street/lot sweeping. The proposed project would include these BMPs and would therefore be consistent with this plan.

City of Huntington Beach General Plan

The City of Huntington Beach advances public safety and welfare in the City through its General Plan Elements and compliance with applicable local regulations in the Huntington Beach Municipal Code. The Utilities Element of the Infrastructure and Community Services Chapter of the Huntington Beach General Plan (1996) contains goals, objectives, and policies related to water quality and storm drainage. These policies are set forth below in Table 3.8-2, along with an analysis of the consistency of the proposed project with the specific policies.

Table 3.8-2 General Plan Utilities Element—Policies Applicable to Hydrology and Water Quality

<i>Policy</i>	<i>Project Consistency</i>
Objective U 1.2. Ensure that existing and new development does not degrade the City's surface waters and groundwater basins	Conformance with implementing policies in the General Plan and NPDES permit requirements would result in conformance with this objective.
Goal U3. Provide a flood control system which is able to support the permitted land uses while preserving the public safety; upgrade existing deficient systems; and pursue funding sources to reduce the costs of flood control provision in the City.	Conformance with implementing policies, as discussed below, results in conformance with this goal.
Objective U 3.1. Ensure that adequate storm drain and flood control facilities are provided and properly maintained in order to protect life and property from flood hazards.	Conformance with implementing policies in the General Plan and NPDES permit requirements would result in conformance with this objective.
Policy U 3.1.1. Maintain existing storm drains and flood control facilities, upgrade and expand storm drain and flood control facilities.	The proposed project includes improvements to storm drain infrastructure to adequately serve the project. These improvements, in connection with planned improvements to the City storm drain system, ensures conformance with this policy.
Policy U 3.1.3. Monitor the demands and manage development to mitigate impacts and/or facilitate improvements to the storm drainage system.	The proposed project includes improvements to storm drain infrastructure to adequately serve the project. These improvements, in connection with planned improvements to the City storm drain system, ensures conformance with this policy.
Policy U 3.1.4. Design, preserve, and acquire land, as necessary, for storm drainage and flood control facilities.	The proposed project includes improvements to storm drain infrastructure to adequately serve the project. These improvements, in connection with planned improvements to the City storm drain system, ensures conformance with this policy.
Policy U 3.1.5. Limit new development, when necessary, until adequate flood control facilities are constructed to protect existing development and accommodate new development runoff, or until mitigation is provided in accordance with the Growth Management Element.	The proposed project includes improvements to storm drain infrastructure to adequately serve the project. These improvements, in connection with planned improvements to the City storm drain system, ensures conformance with this policy.
Policy U 3.1.6. During development review, determine if any structures meant for human habitation are constructed within the 100-year flood plain. If necessary, evaluate the structures' flood safety, and require remedial actions.	The project site is located outside of the 100-year flood plain. Therefore, substantial flood flows would not be redirected by placement of structures on the project site. The proposed project would be consistent with this policy.

Table 3.8-2 General Plan Utilities Element—Policies Applicable to Hydrology and Water Quality

<i>Policy</i>	<i>Project Consistency</i>
Objective U 3.2. Ensure the costs of infrastructure improvements to the storm drain and control system are borne by those who benefit.	Conformance with implementing policies in the General Plan and NPDES permit requirements would result in conformance with this objective.
Policy U 3.2.1. Require improvements to the existing storm drain and flood control facilities necessitated by new development be borne by the new development benefiting from the improvements; either through the payment of fees; or by the actual construction of the improvements in accordance with State Nexus Legislation.	The proposed project includes, as a condition of approval, improvements to storm drain infrastructure to adequately serve the project. The costs of these infrastructure improvements are to be borne by the developer. Therefore, the proposed project is consistent with this objective.
Objective U 3.3. Ensure that storm drain facilities (channels and outputs) do not generate significant adverse impacts on the environment in which the facilities traverse or empty.	Conformance with implementing policies in the General Plan and NPDES permit requirements would result in conformance with this objective.
Policy U 3.3.1. Evaluate any existing environmental degradation or potential degradation from current or planned storm drain and flood control facilities in wetlands or other sensitive environments.	The proposed project includes as part of its Water Quality Management Plan installation of filtration and screening devices to promote maximum water quality in stormwater runoff. With implementation of this plan and BMPs, the proposed project would not be expected to adversely impact wetlands or other sensitive environments and would be consistent with this policy.
Policy U 3.3.2. Where feasible, utilize natural overland flows, open channels, and swale routings as preferred alignments for components of drainage systems.	The proposed project's infrastructure improvements will connect to the existing City storm drain system. No new channels would be constructed as part of the project. Therefore, the proposed project would be consistent with this policy.
Policy U 3.3.3 Require that new developments employ the most efficient drainage technology to control drainage and minimize damage to environmental sensitive areas.	The proposed project includes as part of its Water Quality Management Plan installation of filtration and screening devices to promote maximum water quality in stormwater runoff. With implementation of this plan and BMPs, the proposed project would be consistent with this policy.
Policy U 3.3.4. In areas of known subsidence, require new development to minimize the use of cross gutters and utilize technology such as low-flow storm drains.	Storm drains installed as part of the proposed project would conform to City of Huntington Beach and Orange County Flood Control standards, and would thus be consistent with this policy.

The Environmental Hazards Element of the Hazards Chapter of the General Plan includes policies related to flooding risk, described below in Table 3.8-3.

Table 3.8-3 General Plan Environmental Hazards Element—Policies Applicable to Hydrology and Water Quality

<i>Policy</i>	<i>Project Consistency</i>
Goal EH.4. Eliminate, to the greatest degree possible, the risk from flood hazards to life, property, public investment, and social order in the City of Huntington Beach.	As discussed in the Initial Study, the project is not located within a 100-year flood zone as defined by FEMA flood insurance rate maps. Therefore, conformance with implementing policies contained in the General Plan results in conformance with this goal.
Objective EH 4.1. Ensure that the City's flood prevention standards and practices provide satisfactory safeguards for public and private development.	Conformance with implementing policies, as discussed below, results in conformance with this objective.
Policy EH 4.1.1. During major redevelopment or initial construction, require specific measures to be taken by developers, buildings, or property owners in flood-prone areas to prevent or reduce damage from flood hazards and the risks upon human safety.	The project site is not located within a 100-year flood zone as defined by FEMA flood insurance rate maps. The Initial Study identified that the risk from flooding was less than significant and no further analysis was required in the EIR. Stormwater runoff measures will be implemented as part of the proposed project, which, in conjunction with planned improvements in the City storm drain system, would ensure that stormwater runoff would not significantly increase as a result of the proposed project. Therefore, the proposed project would be consistent with this policy.
Goal EH 5. Protect human life, to the greatest extent feasible, from tsunamis and seiche hazards.	Conformance with implementing policies, as discussed below, results in conformance with this goal.
Objective EH 5.1. Provide information regarding tsunami, seiche, and tidal/marine hazards, and promote methods to minimize potential damage.	Conformance with implementing policies, as discussed below, results in conformance with this objective.
Policy EH 5.1.1. Identify tsunami and seiche susceptible areas, and require that specific measures be taken by the developer, builder, or property owner, during major redevelopment or initial construction, to prevent or reduce damage from these hazards and the risks upon human safety. (Also refer to Policy C 10.1.19, Natural Resources Chapter, Coastal Element.)	As noted below, the proposed project is subject to tsunami hazards because the eastern portion of the project site is located in the designated moderate tsunami run-up area in the General Plan. Although tsunami flooding may pose a hazard to some buildings constructed as part of the project, past experience indicates that the potential for tsunami damage in the City is low. In addition, the risk of tsunami hazards has been accounted for in the City of Huntington Beach Emergency Management Plan, which designates the project area as Primary Danger Area 4 and suggests an evacuation site for the area in the event of a tsunami incident. Conformance with implementing policies results in conformance with this policy.

The Coastal Element of the Natural Resources Chapter contains policies pertaining to urban runoff and drainage in the coastal zone. The project site is located in Zone 4 (Downtown) of the coastal designation. Table 3.8-4 describes policies pertinent to the proposed project as well as analyzes project consistency with these policies.

Table 3.8-4 General Plan Coastal Element—Policies Applicable to Hydrology and Water Quality

<i>Policy</i>	<i>Project Consistency</i>
Policy C 6.1.1. Require that new development include mitigation measures to enhance water quality, if feasible; and, at a minimum, prevent the degradation of water quality of groundwater basins, wetlands, and surface water.	The proposed project includes as part of its Water Quality Management Plan installation of filtration and screening devices to promote maximum water quality in stormwater runoff. With implementation of this plan and BMPs, the proposed project would be consistent with this policy.
Policy C 6.1.25. Require that new development and redevelopment minimize the creation of impervious areas and, where feasible, reduce the extent of existing unnecessary impervious areas, and incorporate adequate mitigation to minimize the alteration of natural streams and/or interference with surface water flows.	Stormwater runoff calculations for the project site indicate that there will be an increase in surface drainage as a result of the proposed project. The proposed project includes numerous open space and landscaped areas. The project would not alter natural streams or substantially interfere with surface water flows, but would alter surface water flows by diverting the majority of runoff to the First Street storm drain system. Improvements to the existing City storm drain system in conjunction with infrastructure improvements constructed by the proposed project ensure that surface runoff would be accommodated within the existing City storm drain system. Therefore, the proposed project would be consistent with this policy.
Policy C 10.1.14. During major redevelopment or initial construction, require specific measures to be taken by developers, builders, or property owners in flood-prone areas to prevent or reduce damage from flooding and the risks upon human safety. Development shall, to the maximum extent feasible and consistent with the Water and Marine Resource policies of this Local Coastal Plan, be designed and sited to (a) avoid the use of protective devices; (b) avoid encroachments into the floodplain; and (c) remove any encroachments into the floodplain to restore the natural width of the floodplain.	The project site is not located within a 100-year flood zone as defined by FEMA flood insurance rate maps. No encroachments into the floodplain would result from the proposed project. The Initial Study identified that the risk from flooding was less than significant and no further analysis was required in the EIR. Stormwater runoff measures will be implemented as part of the proposed project, which, in conjunction with planned improvements in the City storm drain system, would ensure that stormwater runoff would not significantly increase as a result of the proposed project. Therefore, the proposed project would be consistent with this policy.
Policy C 10.1.18. Maintain the City's portion of the flood control system at a level necessary to protect residents from 100-year flood risks. Upgrades to the flood control system shall incorporate the best mitigation feasible.	The proposed project includes improvements to storm drain infrastructure to adequately serve the project. These improvements, in connection with planned improvements to the City storm drain system, would ensure conformance with this policy.
Policy C.10.1.19. Identify tsunami and seiche susceptible areas and require that specific measures be taken by the developer, builder, or property owner during major redevelopment or initial construction to prevent or reduce damage from these hazards and the risks upon human safety. Development permitted in tsunami and seiche susceptible areas shall be designed and sited to minimize this hazard and shall be conditioned to prohibit a shoreline protective device.	As noted below, the proposed project is subject to tsunami hazards because the eastern portion of the project site is located in the designated moderate tsunami run-up area in the General Plan. Although tsunami flooding may pose a hazard to some buildings constructed as part of the project, past experience indicates that the potential for tsunami damage in the City is low. In addition, the risk of tsunami hazards has been accounted for in the City of Huntington Beach Emergency Management Plan, which designates the project area as Primary Danger Area 4 and suggests an evacuation site for the area in the event of a tsunami. Conformance with implementing policies results in conformance with this policy.

The Growth Management Element contains policies pertaining to urban runoff and drainage in the coastal zone. Table 3.8-5 identifies goals and objectives presented in the Growth Management Element of the

General Plan related to hydrology and water quality that are potentially relevant to the proposed project. This table also includes an assessment of the proposed project's consistency with the policies adopted in support of these goals and objectives.

Table 3.8-5 General Plan Growth Management Element—Policies Applicable to Hydrology and Water Quality

<i>Goal, Objective, or Policy</i>	<i>Project Consistency</i>
Goal GM 7. Provide a flood control system capable of supporting permitted land uses while preserving the public safety; upgrade existing deficient systems; pursue funding sources to reduce the costs of flood control provision to the City.	Conformance with implementing policies, as discussed below, results in conformance with this goal.
Objective GM 7.1. Ensure that adequate storm drain and flood control facilities are provided and properly maintained in order to protect life and property from flood hazards.	Conformance with implementing policies, as discussed below, results in conformance with this objective.
Policy GM 7.1.2. Provide a local storm drain system that will accommodate a 100-year floodplain storm.	The proposed project would not place housing or structures within a 100-year flood hazard area. The County of Orange is currently constructing improvements along the Huntington Beach Channel, with an expected completion in the summer of 2004. The improvements will increase the efficiency of the channel to a level capable of accommodating a 100-year storm event. These improvements, in connection with planned improvements to the City storm drain system, ensures conformance with this policy.

3.8.3 Thresholds of Significance

The proposed project would result in significant impacts on hydrology or water quality if it would do any of the following:

- Violate any water quality standards or waste discharge requirements
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount or surface runoff in a manner which would result in flooding on or off site
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality
- Result in inundation by tsunami

3.8.4 Project Impacts

Impact HYD-1 The proposed project would not violate water quality standards, waste discharge requirements, result in substantial sources of polluted runoff, or otherwise substantially degrade water quality.

For the purposes of this analysis, effects from violation of water quality standards, waste discharge requirements, or degradation of water quality would be considered significant if discharges associated with the project would (1) create pollution, contamination, or nuisance as defined in Section 13050(k) through (m)⁸ of the California Water Code or (2) cause regulatory standards, as defined in the applicable NPDES stormwater permit number CAS618030, Water Quality Control Plan or the City's Stormwater and Urban Runoff Management Ordinance for the receiving water body, to be violated. Alterations to the existing drainage pattern of the site or area that would result in substantial additional polluted runoff as, defined by Water Code Section 13050(k) through (m), would be considered significant if the project affects the rate or change in the direction of movement of existing contaminants or expands the area affected by contaminants.

Construction Discharges

As discussed in Section 3.6 (Geology and Soils), the proposed site is greater than 5 acres in size, and is subject to the provisions of the General Construction Activity Stormwater Permit adopted by the SWRCB. One of the purposes of this permit is to ensure minimal water quality effects from stormwater runoff. The developer for the proposed project must submit a Notice of Intent (NOI) to the SWRCB for coverage under the Statewide General Construction Activity Stormwater Permit and must comply with all applicable requirements, including the preparation of a Stormwater Pollution Prevention Plan (SWPPP), applicable NPDES regulations, and BMPs.

⁸ This section of the water code provides definitions for various terms used to discuss water quality, as follows:

- (k) "Contamination" means an impairment of the quality of the waters of the state by waste to a degree that creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.
- (l) (1) "Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following:
 - (A) The waters for beneficial uses.
 - (B) Facilities that serve these beneficial uses.
- (2) "Pollution" may include "contamination."
- (m) "Nuisance" means anything which meets all of the following requirements:
 - (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
 - (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
 - (3) Occurs during, or as a result of, the treatment or disposal of wastes.

The SWPPP is a separate document that is site-specific and provides guidelines to identify impacts on and mitigation of stormwater discharges and water quality during construction. The SWPPP identifies BMPs (stormwater, nonstormwater, and post construction), site monitoring, including reports and revisions, responsible parties, and training in the implementation of the BMPs. The SWPPP must describe the site, the facility, erosion and sediment controls, runoff water quality monitoring, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control measures, maintenance responsibilities, and nonstormwater management controls. Inspection of construction sites before and after storms is required to identify stormwater discharge from the construction activity and to identify and implement controls where necessary. An outline of the proposed SWPPP for the project can be found in Appendix G of this document. In addition, the project would be required to comply with all NPDES permit requirements during and post construction, which would ensure that impacts with regard to pollution in stormwater discharges would be less than significant.

In addition, all construction activities would comply with Orange County guidelines for excavation and grading, the City's Grading Manual, and the Huntington Beach Municipal Code. These guidelines include specifications designed to minimize effects from erosion during construction. For instance, the Municipal Code identifies, defines, and provides regulation for erosion control systems that are part of construction projects in order to ensure maximum effectiveness. Therefore, compliance with the Statewide General Construction Activity Stormwater Permit requirements and other applicable requirements with respect to excavation and grading would ensure that impacts related to construction stormwater discharge would be less than significant.

Operational Discharges

The proposed project is required by the City to develop and implement a Water Quality Management Plan (WQMP) that, upon approval, would serve as the manual to maintain water quality in conformance with the NPDES Permit and County of Orange DAMP. The WQMP would be specific to the expected pollutants that would be present in the stormwater flow from the site after completion of construction. The WQMP would also detail the specific operation and maintenance of each structural and nonstructural BMP. Some of the BMPs may be as simple as street-sweeping on a monthly basis, while other BMPs may include programs to educate the public on the proper disposal of hazardous/toxic wastes, pickup and disposal of animal feces, regulatory approaches, and detection and elimination of illicit and illegal dumping. The WQMP would outline the types of BMPs being used and outline a routine maintenance schedule for each BMP, in compliance with the DAMP and local regulations. The WQMP is established from industry and agency historical data and the best available information or initial concept and design.

A Preliminary Water Quality Management Plan (PWQMP) has been developed for the project and outlines the comprehensive approach that would be used in the attainment of water quality goals required for the proposed project (Appendix G). This plan conforms to the NPDES Permit and current DAMP, and supports the City's commitment to the protection and enhancement of coastal water quality. The plan also complements the goals and mission statement of the City of Huntington Beach Citywide Water Quality Management Plan Task Force. The PWQMP serves as the foundation of the final WQMP and explains the methodology used to determine the types of management practices that are best suited for the proposed project, to achieve the required water quality levels as detailed by the DAMP and local requirements.

The PWQMP includes filtration (treatment of runoff from the site) as a key component of the overall system. Pollutant loads for existing and developed conditions were calculated to determine recommendations and requirements for filtration. These requirements would be achieved on the project site through the use of a series of state-of-the-art pollutant filters incorporated into the storm drain system. These filters are described in technical detail in the drainage report prepared by Hunsaker & Associates (Appendix G). In conjunction with these filters, a screening unit is proposed, which would provide additional screening of stormwater and is primarily focused on the treatment of trash, debris, and larger solids. On-site drainage areas would have first-flush and dry weather flows treated by these systems. After treatment, the first-flush and dry weather flows would be discharged into the storm drain system in Pacific View Avenue, as well as into the drainage system in First Street that is proposed as part of the project, and further discussed in impact HYD-2. If additional treatment of petroleum hydrocarbons is required, specialized filtration inserts can be installed to reduce these pollutants.

In addition, as part of the comprehensive stormwater treatment plan, the proposed project would incorporate the requirements of DAMP Section 7, including all feasible recommended BMPs. Other BMPs may include programs to educate the public on the proper disposal of hazardous/toxic wastes, pickup and disposal of animal feces, regulatory approaches, and detection and elimination of illicit and illegal dumping. Plans for grading, drainage, and erosion control would be reviewed by the City Engineer prior to issuance of grading permits. With implementation of these BMPs and the WQMP, all impacts related to water quality would be reduced to the maximum extent practicable, as required by the DAMP and City regulations, and would be considered less than significant.

The proposed project does not currently anticipate the need for dewatering for the development. Should site conditions or future project revisions require a dewatering program, the program would be developed in accordance with the California Regional Water Quality Control Board, Santa Ana Region, Order No. 93-49, NPDES Permit No. CAS618030, and Template Monitoring and Reporting Program No. 98-67.

Impact HYD-2 The proposed project would alter the drainage patterns of the site, but not in a manner that would create substantial flooding, erosion, or siltation on or off site, or result in substantial additional polluted runoff.

Alterations to the existing drainage pattern of the site or area that would result in flooding would be considered significant if the project results in or exacerbates existing localized flooding during periodic rainfall, expands the area affected by flooding, or creates or contributes runoff water that would exceed the capacity of existing or planned stormwater drainage systems. For purposes of this analysis, the proposed project would have a significant impact if it substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would create substantial erosion or siltation on or off site.

Overview

The proposed project would be divided into two separate drainage areas with separate storm drain systems, as illustrated by Figure 3.8-5. The intent of this configuration would be to reduce runoff directed to the ASWPS. The predevelopment drainage area of 34.6 acres, currently tributary to the ASWPS, would be reduced to a 7.7-acre area designated Drainage Area “A.” The balance of the site would be designated Drainage Area “B,” and would be directed to the proposed project-specific drainage system in First Street, discussed below.

Table 3.8-6 compares first flush discharges pre- and post-development, and Table 3.8-7 summarizes post-development conditions for the discrete drainage areas. First-flush discharges to the ASWPS would be reduced from 5.0 cfs to 1.2 cfs. Discharges to First Street would be 3.8 cfs. The reduction in flows directed to the ASWPS from the reconfiguration of the drainage areas on-site would result in a reduction in 100-year storm flow from 67.0 cfs to 21.8 cfs to the ASWPS. All proposed drainage improvements would be designed and constructed in accordance with the standards set by the City of Huntington Beach and the Orange County Flood Control District.

Table 3.8-6 Summary of First Flush Discharges		
Discharges to:	Area “A” (cfs)	Area “B” (cfs)
ASWPS (existing)	Total 5.0 from both areas	
ASWPS (with project)	1.2	0
First Street (existing)	0	0
First Street (with project)	0	3.8

SOURCE: *Drainage Study Including Preliminary Hydrology Analysis and Water Quality Analysis*, Hunsaker & Associates, April 14, 2003a.

Table 3.8-7 Projected Drainage Conditions (in cfs)			
Storm Event (Year)	Drainage Area "A"	Drainage Area "B" – prior to detention	Drainage Area "B" – post-detention
25	16.7	66.1	20.0
100	21.8	85.2	20.0

SOURCE: *Drainage Study Including Preliminary Hydrology Analysis and Water Quality Analysis*, Hunsaker & Associates, April 14, 2003a.

Drainage Impacts—Area "A"

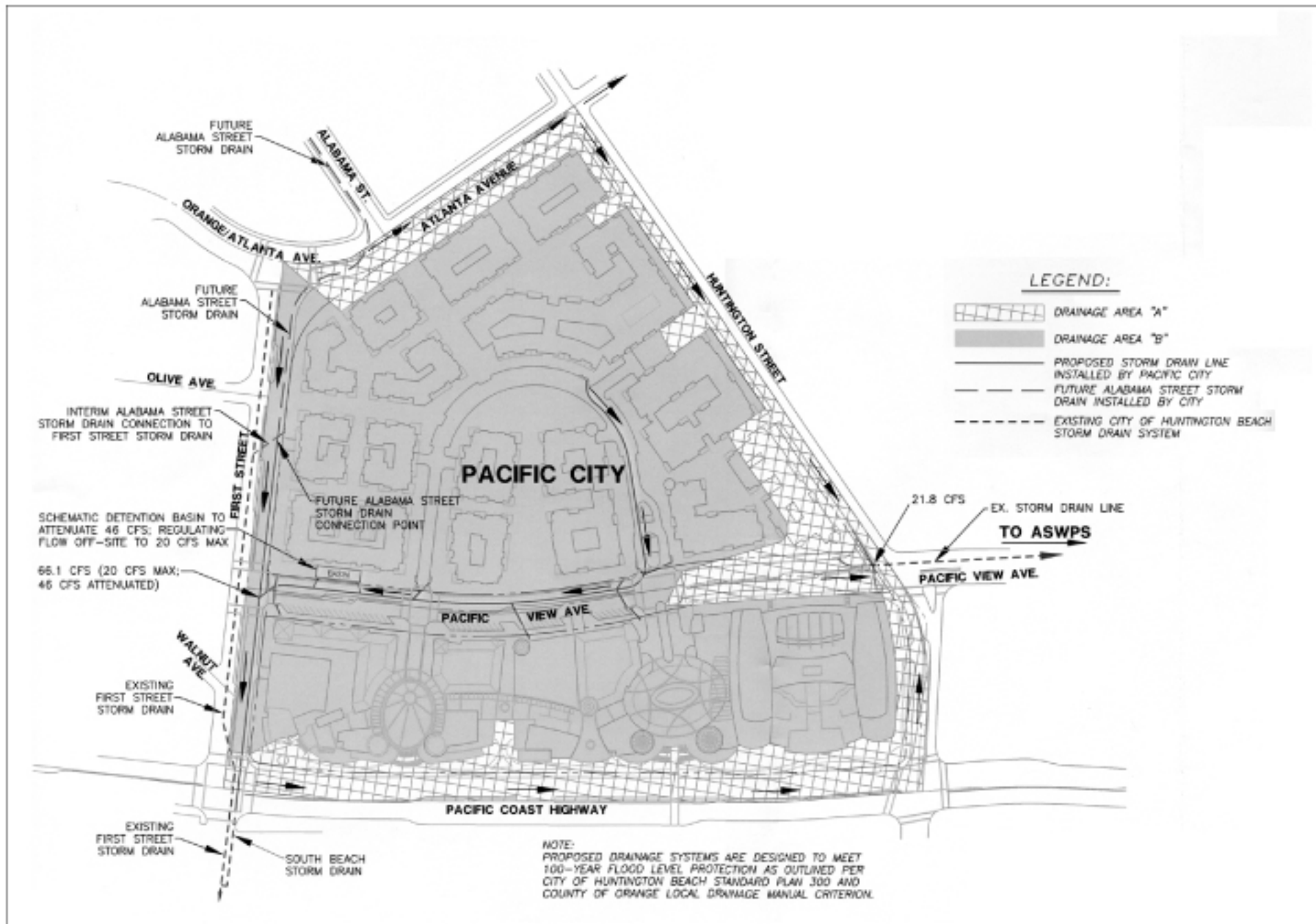
Area "A" would be serviced by a proposed system of inlets and underground pipe conduits joining the existing 42-inch storm drainpipe at the intersection of Pacific View Avenue and Huntington Avenue. With implementation of the proposed project, a maximum of 21.8 cfs would be permitted to be discharged into the existing 42-inch pipe in Pacific View Avenue. Drainage Area "A" has been sized appropriately to this discharge limit for estimates of a discharge of 21.8 cfs in a 100-year event. The expected discharge to the ASWPS is well below both the designed allowable discharge of 34.4 cfs and the current condition of 67.0 cfs discharged during a 100-year event (refer to Appendix G, Section 1, page 4).

Drainage Impacts—Area "B"

The storm flows from Drainage Area "B" would flow west to First Street. The project proposes to construct a storm drain line in First Street that would exclusively serve the project site. This line would run parallel to the existing City 36-inch line in First Street. The project-specific storm drain line would then connect to the City's 36-inch South Beach Storm Drain south of PCH. As required by the City Public Works Department, the project would be limited to flows of 20 cfs from Drainage Area "B," based on overall planned pipe capacity of the City system.

As shown in Table 3.8-7, post-project hydrology of Area "B" would result in runoff of 66.1 cfs in a 25-year storm event. As a result, a reduction in discharge of about 46 cfs would be required in order to limit the discharge to 20 cfs. An on-site underground detention basin is proposed to accomplish this reduction. A volume of about 0.82 acre-feet is required for the required reduction in discharge. Flows exceeding attenuation limits would be allowed to run off via surface streets, and the drainage study has indicated that the volume of this runoff would not impact drainage systems or flood traffic lanes.

According to the Orange County Local Drainage Manual, habitable structures require protection for a 100-year event. The proposed City drainage system along First Street and the proposed project Area "B" drainage system are designed to convey flows from a 25-year event. For storms above the 25-year event and up to the 100-year event, site discharges would be conveyed via surface street flow along First Street, thus meeting flood protection goals. The site is above the 100-year flood elevation defined by FEMA.



200 100 0 200
GRAPHIC SCALE: 1" = 200'



EIP
ASSOCIATES

SOURCE: Hunsaker & Associates Irvine, Inc. 2003a

10281-00

FIGURE 3.8-6
Proposed Drainage

City of Huntington Beach • Pacific City EIR

While the proposed project would alter the direction of runoff flows, the drainage alterations to the site and adherence to the requirements of the NPDES permit and the WQMP would not result in exacerbation of localized flooding; in fact, the changes in the drainage patterns, as well as the proposed detention basin, would divert a significant portion of the site's surface runoff from the over-capacity ASWPS to a new storm drain system, which would be designed to ensure adequate capacity to accommodate stormwater flows from the project site.

In order to ensure adequate drainage improvements, all features of the proposed system would be designed and constructed in accordance with the standards set by the City of Huntington Beach and the Orange County Flood Control District. Plans for grading, drainage, and erosion control would be reviewed by the City Engineer prior to issuance of grading permits. Therefore, with inclusion of the project features designed to minimize drainage, this impact would be less than significant.

Impact HYD-3 The proposed project would contribute to a reduction of flows to the over-capacity Atlanta Stormwater Pumping Station.

The ASWPS has a current capacity of 551 cfs, as noted above. The tributary area it services discharges approximately 1,125 cfs in a 100-year event. This indicates a capacity deficiency of about 574 cfs. Currently, approximately 177 cfs is discharged to the ASWPS from the Alabama Street Discharge Area, including the proposed project site. With the proposed City storm drain system along First Street and the proposed project's Area "B" drainage system, approximately 155.2 cfs in a 100-year event would be diverted away from the ASWPS. With implementation of the proposed project, the northerly, easterly, and southerly perimeter area shown as Drainage Area "A" on Figure 3.8-5, or 21.8 cfs, would discharge to the existing 42-inch pipe, located in Pacific View Avenue, that discharges to the ASWPS. This would be a net reduction of about 85 percent. Design flows to the ASWPS can therefore be reduced from 1,125 cfs to 968.8 cfs as a result of the diversion of flows and the capacity deficiency reduced from 574 to 396 cfs. Thus, a beneficial impact would result from implementation of the proposed project, in that stormwater flows to the ASWPS would be substantially reduced and fall below the design capacity of the ASWPS.

Impact HYD-4 The proposed project would result in the placement of additional structures in an area of low to moderate tsunami risk.

Inundation by tsunami would be considered significant if the project would substantially intensify tsunami hazards and as a result, substantial damage to structures or infrastructure, or exposure of people to this risk would result. Due to its location on the coast, the City of Huntington Beach is subject to potential run-up and tsunami damage from both distant and locally generated tsunamis. The eastern portion of the project

site is located in the designated moderate tsunami run-up area in the General Plan and may be subject to tsunami hazards.

When a tsunami reaches shallow coastal areas, the incoming tide “runs up” on beaches and into harbors and other narrow inlets. Such an event could damage light-weight or poorly anchored structures. Preceding the initial wave and following each surge, the water withdrawn from these coastal areas often causes structures to be dislodged further, as they are undercut by scour/erosion and pulled seaward. According to the City of Huntington Beach General Plan EIR, the most severe damage associated with a tsunami would be in the Huntington Harbor.

Although tsunami flooding may pose a hazard to some buildings constructed as part of the project, past experience indicates that the potential for tsunami damage in the City is low. In addition, policies to address tsunami hazards are included in the City’s General Plan. The policies include identification of tsunami-susceptible areas; requiring developers, builders, or property owners to undertake specific measures during initial construction to prevent or reduce damage from tsunami hazards; participation in the National Weather Service or other system for local tsunami warnings; and providing information to the public regarding tsunami areas and emergency response plans. In addition, the risk of tsunami hazards has also been accounted for in the City of Huntington Beach Emergency Management Plan, which designates the project area as Primary Danger Area 4 and suggests an evacuation site for the area in the event of a tsunami incident. The developer, builder, or property owner of the proposed project would be required to conform to the requirements of the Coastal Element of the City’s General Plan by defining and implementing specific measures during initial construction to prevent or reduce damage from tsunami hazards. In the absence of these measures, impacts from tsunamis would be potentially significant.

3.8.5 Cumulative Impacts

The cumulative impact analysis considers development of the proposed project, in conjunction with full implementation of the City of Huntington Beach General Plan. As all development is required to comply with applicable federal, State, and local regulations, cumulative development should not violate water quality standards or waste discharge requirements, and thereby would not result in a significant cumulative impact. Cumulative development within the City of Huntington Beach would generate similar hydrology and water quality impacts to those of the proposed project. Each of these projects would be subject to the basic requirements and mitigation measures as the proposed project to address hydrology and water quality issues. Projects involving construction on sites greater than 1 acre would be required to obtain NPDES permits and construction and operation activities would occur in compliance with the Orange County DAMP.

As the City of Huntington Beach is within a developed urban setting, it is not expected that full implementation of the City of Huntington Beach General Plan would result in the conversion of large amounts of open space to urban uses, and it is therefore not expected that there would be a significant increase in runoff in the City as a whole. Most of the drainage system in the watershed consists of engineered storm channels and, therefore, is expected to experience little change. Additionally, the proposed project was considered under the City of Huntington Beach's Master Plan of Drainage and, with the planned improvements to the City's storm drain system and project infrastructure, adequate drainage infrastructure would be available. Additionally, future development would be required to comply with stormwater discharge laws and to obtain the proper permits. Consequently, cumulative impacts would be less than significant with regard to this potential impact. The contribution of the proposed project to cumulative impacts on hydrology and water quality is less than significant, because stormwater flows are not expected to increase significantly overall, and because the project would result in a decrease in flows to the Atlanta Stormwater Pumping Station, which would be a beneficial effect.

Cumulative development would not substantially alter the existing drainage pattern of the area, including the alteration of the course of a stream or river, in such a manner that would result in substantial erosion or siltation, flooding, or the exceedance of existing or planned stormwater drainage systems. Implementation of NPDES Phase I and II requirements are designed to ensure that cumulative development does not result in higher-than-allowed concentrations of pollutants in stormwater discharges, and appropriate stormwater treatment would ensure that discharges into the ocean would not violate water quality standards. Extensive development is not anticipated in the remaining open spaces in the Talbert Watershed, and it is unlikely that substantial alteration of drainage systems and watercourses in those areas would occur. This indicates that the amount of runoff would not substantially increase, thereby avoiding substantial increases in erosion, siltation, flooding, and preventing the exceedance of capacity of the stormwater drainage system. As a consequence, it is not expected that impacts would be cumulatively considerable, and the project would have a less-than-significant contribution to this effect.

Cumulative development is not expected to otherwise substantially degrade water quality. Substantial increases in runoff are not expected to occur, and compliance with NPDES requirements and CEQA mitigation would ensure that water quality in the watershed is not degraded by future development. Additionally, project compliance with NPDES requirements and the small amount of runoff would ensure that the project contribution to cumulative impacts is also less than significant. Cumulative impacts would, therefore, be less than significant.

3.8.6 Mitigation Measures and Residual Impacts

The following standard City requirements (CR) would apply to the project.

- CR HYD-A Storm Drain, Stormwater Pollution Prevention Plans (SWPPP), and Water Quality Management Plans (WQMP) conforming to the current National Pollution Discharge Elimination System (NPDES) requirements, prepared by a Licensed Civil Engineer, shall be submitted to the Department of Public Works for review and approval. Catch basins shall be grated and not have side openings.*
- (a) A SWPPP shall be prepared and updated as needed during the course of construction to satisfy the requirements of each phase of the development. The plan shall incorporate all necessary Best Management Practices (BMPs) and other City requirements to eliminate polluted runoff until all construction work for the project is completed. The SWPPP shall include treatment and disposal of all dewatering operation flows, and for nuisance flows during construction.*
- (b) A WQMP shall be prepared, maintained, and updated as needed to satisfy the requirements of the adopted NPDES program. The plan shall incorporate water quality measures for all improved or unimproved phases of the project. All structural BMPs shall be sized to infiltrate, filter, or treat the 85-percentile 24-hour storm event or the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch per hour. Upon approval of the WQMP, three signed copies and an electronic copy on CD (.pdf or .doc format) shall be submitted to the Public Works Department.*
- (c) Location of the BMPs shall not be located within the public right-of-way.*

Impacts to hydrology as described above under Impacts HYD-1 through HYD-3 would be less than significant. In addition to the standard City requirements listed above, the following mitigation measure (MM) would be required to address impacts associated with tsunami risks as described under Impact HYD-4.

- MM HYD-1 Prior to the issuance of grading permits, the developer shall submit to the City for approval a plan outlining specific planning measures to be taken to minimize or reduce risks to property and human safety from tsunami during operation. Planning measures could include but would not be limited to the following:*
- Provision of tsunami safety information to all project residents and hotel guests, in addition to posting in public locations on site*
 - Identification of the method for transmission of tsunami watch and warnings to residents, hotel guests and persons on site in the event a watch or warning is issued*

- *Identification of an evacuation site for persons on site in the event of a tsunami warning*

Implementation of MM HYD-1 would reduce risks associated with tsunamis, as discussed under Impact HYD-4, to less than significant.